DCP 2020-038 REVISION 2

PROPOSED CHANGES TO DASP VOLMUME 3 CHAPTER 6 GENERAL CONCEPTS

Notes to readers:

The text of the amendment is arranged to show deleted text, new or amended text as shown below:

a. deleted text is marked with ~~strike through~~;

b. new or amended text is highlighted in grey.

Chapter 6.10 Aircraft Crash Protection

Purpose

6.10.1 The purpose of the Aircraft Crash Protection (CP) policy is to assure that all Defence aircraft, and aircraft which are contracted to carry Defence personnel are operated in a manner which eliminates or otherwise minimises the CP risks to personnel So Far as is Reasonably Practicable (SFARP).

Background

6.10.2. The Authority has defined the Contemporary Crash Protection Design Requirements (CCPDR) as the most demanding of requirements between the FAR/CSs for civil CCPDR, and relevant military standards for CCPDR. Ideally, Defence aircraft and contracted aircraft which carry Defence personnel should meet CCPDR as prescribed within the Defence Aviation Safety Design Requirements Manual (DASDRM). However, it is not always feasible to select the most CCPDR compliant platform because acquisition/contracting decisions are based on a much wider range of considerations.

6.10.3 In the event that an aircraft is unable to meet the contemporary standards for crash protection, the identified deficiencies will likely be captured within an MCRI, and where applicable, an associated AwIP that details the risk management mitigations. This AwIP, and the system's risk register then provide the basis for review and monitoring of the associated risks as a result of a survivable crash occurring.

6.10.4 As required by the WHS Act 2011, and implemented through DASR.SMS, the MAO must maintain a system to eliminate or otherwise minimise risk So Far As is Reasonably Practicable (SFARP) to personnel resulting from a survivable crash.

6.10.5. Historically, crash protection within the ADF has been regulated in the Authority Rules for Operations (through ARO.40), and before that in a Defence Aviation Authority Directive (DAAD 002/16). It was determined in 2023 that regulating CP through specific obligations on the MAO no longer provided value given the context differences between the contemporary aviation safety environment and that which existed when the CP policy was first published. This change in approach allows MAOs to make risk management decisions without the undue influence of artificial priorities inferred from the existence of specific CP regulations.

6.10.6 Large parts of the guidance contained within the regulation did however remain valuable, assisting for a common understanding of the elements of CP framework for assessment. The CP guidance has transferred here, to DASPMAN Volume 3, to capture the corporate knowledge whilst allowing for greater flexibility in the management of crash protection risk.

Periodic review of risk assessments

6.10.7 Review of Crash Protection is treated like all other risks to health and safety, utilising a risk based approach. Aircraft which represent a high risk, or where the level of risk is not well understood, should be subject to more frequent monitoring and review. Conversely for aircraft which afford a high level of CP or in which there is a lower risk of a survivable crash occurring, less frequent assessment may be more appropriate.

6.10.8 The DASA prescribed CCPDR will continue to evolve over time as better standards and practices are identified, this may result in supplementation to an aircraft's certification basis. In-service management is essential to ensure that CP risks are continually assessed and treated by platform. When an aircraft type fully meets the CCPDR, the MTCH and MAO should ensure that CP risks are periodically re-evaluated in service as part of the review of control measures under DASR.SMS. Where an aircraft does not meet the CCPDR, it is important that the risk is managed under the current provisions in the DASR, being TCB tailoring and an Airworthiness issue paper. Furthermore, aircraft Configuration Role and Environment (CRE) can change due to a variety of factors, which may in turn result in a change of the CP risk. Hence CP risk treatments should be routinely reviewed to ensure their currency dependent on severity of risk.

Principles of Crashworthiness

6.10.9 To optimise occupant protection, a systems approach to CP is necessary, encompassing the following key initial airworthiness and flight operations CP principles. The key to an optimised CP system for a particular aircraft is balance between the principles such that any one factor is not significantly degraded.

Initial airworthiness CP principles:

6.10.10 **Aircraft crash resistance.** The ability of the aircraft structure to provide a protective shell for occupants in the event of a survivable crash is a key factor for occupant survival. The structure and equipment should be designed to allow deformation in a controlled, predictable manner so that forces imposed upon the occupants will be tolerable while still maintaining a protective shell. This aspect also relates to the restraint of concentrated (or high) mass items, to prevent parts of the aircraft becoming projectiles within the cabin during a crash creating crushing or blunt trauma hazards (e.g. engines/transmission/blades coming through the roof, internally mounted items dislodging, etc.).

6.10.11 **Occupant retention.** Protection should be afforded to occupants by the aircraft's retention system, which comprises the seat, seat retention and occupant restraint system assembly. The retention system plays a major role for all aircraft types in preventing occupant contact injuries associated with body parts flailing into aircraft structures. For helicopters the retention system also plays a predominant role in energy absorption.

6.10.12 **Cargo and equipment retention.** Restraint systems should be designed to control cargo and ancillary equipment displacements that are hazardous to occupants during a survivable crash.

6.10.13 **Post-crash emergency escape provisions.** Occupants should retain the ability to rapidly evacuate the aircraft during non-crash ground emergencies, and after survivable crash conditions. The ability to escape is impacted by aircraft deformation, lighting, escape hatches, and so on.

6.10.14 **Post-crash injury prevention.** The crash protection system should be designed to prevent post-crash environmental hazards that could seriously injure occupants. For hazards which cannot be prevented, the crash protection system should protect occupants from exposure to the hazards. Potential post-crash environmental hazards include fire, toxic fumes and submersion. This principle can be extended to include equipment that can improve post-crash survivability after the crash sequence. Such equipment includes first aid kits, survival kits and emergency locator transmitters.

Flight Operations CP considerations:

6.10.15 **Cargo and equipment configuration.** Cargo (including role equipment) configuration in an aircraft can have significant implications on CP and post-crash egress. Consideration must be applied to the way in which this cargo is arranged (its orientation, presence of sharp edges etc.) and where that cargo is restrained in the aircraft. Specific examples include operating with life rafts in helicopter cabins or specialist medical equipment on Aeromedical Evacuation (AME) fixed wing aircraft.

6.10.16 **Secondary seating.** There are operational circumstances where Mission Essential Personnel (MEP) cannot be seated in crashworthy seats during flight and must utilise non-standard restraints and/or seating, eg Special Operations contingency loading. The CP risks for these circumstances should be routinely assessed and treated in accordance with DASR ORO.70.B – Non-standard aircraft restraint and seating.

6.10.17 **Carriage of personal equipment.** Equipment carried on the individual, e.g. ALSE, load carriage equipment, body armour, should be risk assessed and treated in the context of CP and DASR ORO.70 – Carriage of Personnel on Defence Aircraft. Routinely reassessing the CP risks associated with the carriage of personal equipment is especially pertinent as there are many different forms and versions of ADF combat ensemble.

6.10.18 **Egress procedures.** Risks to egress in post-crash circumstances should be considered and treated as part of CP risk assessments. This should include consideration of cockpit/cabin configurations which can block egress routes or cargo/equipment which could make egress hazardous in a post-crash situation.

Guidance/exceptions (risk management/predeterminations)

6.10.19 Given the purpose of the CP requirements are to increase the safety of the personnel on board in the event of a survivable crash, there are some situations where compliance with the ADF CCPDR will not result in a measurable improvement in safety:

6.10.20 **Non–Defence Registered aircraft (NDRA).** This guidance does not apply to occupants who are operating a non–Defence registered aircraft operated by or on behalf of Defence who are not Defence personnel. CASA remains the regulatory authority for such aircraft. The safety of civilian aircrew in these circumstances is regulated by the CASA and the ADF CCPDR is not applied where it does not directly and substantially benefit Defence personnel.

6.10.21 **Warbird, Historic and Replica (WHR).** Aircraft with historical value, for example museum aircraft. Whilst many WHR aircraft will not be compliant to CCPDR, modifications to treat CP shortfalls will likely invalidate the historical significance of these aircraft. Additionally, these aircraft generally operate with a reduced rate of effort compared to operational Defence aircraft and the exposure levels of occupants are limited. Therefore, it is considered that the risks to WHR aircraft occupants in the event of a survivable crash/accident are minimised SFARP.

6.10.22 **Aircraft fitted with ejection seats.** The ability of an occupant to eject from an aircraft prior to a severe crash reduces the benefit which might be obtainable by improving the CP attributes of these aircraft. Previous CP assessments of ejection seat aircraft did not recommend reasonably practicable treatments to reduce the risks of survivable crashes to occupants, when there is the ability to eject from the aircraft in most crash scenarios (refer to DASDRM for further information). It is therefore highly likely, if not certain, that for any aircraft fitted with ejection seats there will be no reasonably practicable treatments for CP shortfalls and thus the risk is considered to be minimised SFARP.

6.10.23 **Ostensibly equivalent civil derivative aircraft.** Certain civil derivative ADF aircraft may be exempted from CCPDR supplementation, provided all the following condition are met:

a. aircraft is compliant to all civil airworthiness requirements defined in its type certification basis;

b. no significant CRE divergence from the civil certified aircraft;

c. and which maintain alignment of CRE and continued operation of the aircraft in a manner ostensibly equivalent to its civil counterpart.

6.10.24 The determination of whether this principle applies should be supported by and articulated through the applicable aircraft's SOIU, and be re-evaluated in the case of any CRE changes.

Crashworthiness Limiting factors.

6.10.25 Where a particular aspect of crashworthiness is significantly degraded beyond that of other aspects, it is important that the overall level of crashworthiness is still accurately articulated. For example, any aircraft for which the initial impact will never be survivable is unlikely to benefit from best in class post-crash fire protection. In these cases where one aspect becomes a limiting factor for the aircraft, any other aspects that will not provide improvement cannot be considered to "increase" the crashworthiness. This aims to ensure that any limiting factors to the crashworthiness of the aircraft are adequately identified, and that any non-functional safety improvements do not decrease the CP risk. This should not reduce the importance or desire to improve aspects of crashworthiness that can be improved, only that the risks are required to be evaluated and articulated accurately where limiting factors are present, and design changes are not considered in isolation.

Other Considerations/mitigations

6. 10.26 **Changes to aircraft CRE.** Proposed changes to the CRE of an aircraft have the potential to affect the CP attributes of an aircraft from both an airworthiness and flight operations perspective. For example, a modification that adds significant weight to a helicopter may change the crash impact attenuation properties of the undercarriage. A change in aircraft operating environment may alter the prevalent crash types for which the aircraft was designed. Changes to an aircraft's CRE must be carefully assessed to ensure the level of CP inherent in the original design and its operation are not compromised, and any impacts on extant CP attributes are evaluated to identify treatment options and confirm that associated risks are reduced SFARP.

6.10.27 **Contracted, leased and civil certified aircraft.** Where aircraft are contracted/leased by Defence to carry Defence personnel and the CRE is the same as, or substantially similar to civilian Regular Public Transport (RPT) or Charter, the risks being retained by the relevant RMA would be the same or very similar (assuming the same CRE) as for civilian use under the instrument issued by the relevant Civil Aviation Authority (CAA). Therefore, the risks associated with the aircraft's CP attributes and approval by the relevant CAA provides a basis for an assessment of the risks by the relevant authority. Any identified shortfalls must also be analysed to ensure the risk posed does not warrant treatment to support the determination that the CP risks are minimised SFARP.

6.10.28 **Planned Withdrawal Date.** Aircraft close to the Planned Withdrawal Date (PWD) are subject to the scope of this guidance. The risks associated with CP shortfalls of Defence aircraft close to PWD must be assessed to ensure the risks in the event of a survivable crash are minimised SFARP. However, due to the expected significantly lower operating hours in the remaining life of an aircraft close to the PWD, the likelihood of a survivable crash occurring is significantly reduced and therefore any benefits gained through treating shortfalls to CCPDR are likely to be significantly reduced. Consequently, treatments are less likely to be reasonably practicable, with the exception of those which are relatively low cost and can be implemented in a short timeframe. The above needs to be considered when involving conducting an assessment and retaining any residual risk, for an aircraft that has been identified for withdrawal from service.

6.10.29 **Limited Configuration Control.** Defence may pursue support arrangements involving Limited Configuration Control (LCC) to maintain configuration parity with other operators to minimise in-service support costs and avoid an 'orphan' or unique fleet. Regardless, aircraft with LCC are subject to the requirements of thee DASDRM.

Maintaining a system to treat CP risk to personnel

6.10.30 The core working components of this guidance supports a risk based approach, where risk is identified, analysed, evaluated, communicated and managed by the appropriate entity. The CP risk management framework and the associated risk assessment process described here should be considered in conjunction with DASR.SMS. The framework can then be used to define the means to assess risk, identify treatments, assess the benefit of operational or technical treatments, make a judgement of whether any residual risk has been minimised SFARP, and define the appropriate Risk Management Authority (RMA) who is responsible for retaining any residual CP risk.

6.10.31 **Mission specific CP considerations.** 'Standing' risk assessments should be based on standard/routine aircraft CRE and any risks identified would be eliminated or otherwise minimised SFARP via additional controls, including amendments to Orders, Instructions, Procedures (OIP). Hence, it is assumed that any key risks will be identified and managed. Mission specific risks refers to risks that would arise from non-standard or operational contingency tasks where additional consideration should be given to any impacts on survivability in the event of a survivable crash. Assessment of mission specific risks is an ongoing process and captured under Core Risk Profiles (CRP), Mission Risk Profiles (MRP) or Risk Management Plans (RMP) through the Risk Management process. A balanced approach to treating risks is required, in order to achieve the mission. This may include assessing the benefits of exposing Defence personnel to any risks, for example, whether the need to carry passengers outweighs any risks associated with a contingency scenario, or the carriage of specific Dangerous Goods (DG).

CP Risk Management Framework.

6.10.32 Management of CP risk follows the Defence 7 step risk management process. Given the complexities with assessing CP risk, the below is guidance regarding an acceptable method of conducting that assessment.

6.10.33 CP risk assessments should involve a number of stakeholder agencies and organisations and are fundamental to achieving compliance to the Regulation. A system must be in place to treat the outstanding risks identified through the risk assessment process. General guidance on Risk Management is contained within the DASR.SMS, with this Regulation providing additional CP-specific context and guidance. CP risk assessment and treatment processes should be informed by reference to both these sources. The framework introduces common descriptors for consequence and likelihood, and a common safety risk matrix across the aviation safety and WHS domains. It also introduces likelihood definitions for system level and activity level contexts, which enables risk assessments to be translated across safety management systems. This process involves establishing the risk assessment context, conducting a CP evaluation, establishing the pre-treatment risk level, identifying and prioritising risk treatments, establishing the post-treatment risk level and communicating the outcomes to the appropriate authority to inform risk treatment decisions.

Establish the CP Context.

6.10.34 The context of the risk analysis for CP is that the risks to occupants for design related shortfalls are only realised in the event of a 'survivable' crash. Although CP risks are usually related to aircraft designs which are not fully compliant to the CCPDR, risk treatments will eliminate or otherwise minimise the risk SFARP through either operational or design controls, e.g. cease or minimise flight over water if there is insufficient life rafts/life raft capacity in accordance with the CCPDR. Design related controls aim to improve aircraft crash performance by following principles contained in the Defence Aviation Safety Design Requirements Manual (DASDRM).

6.10.35 The CP evaluation is to be conducted by the relevant CASG PO or SPO for acquisition and in-service aircraft types and Service Chiefs for potential new aerospace capability options. This is conducted in accordance with DASR Part 21 and the Authority prescribed CCPDR in the DASDRM. The result will be an overall level of CP provided to occupants in the event of a survivable crash, expressed in terms of the CP risk level definitions in Table 1.

6.10.36 Where there are shortfalls against the CP design requirements, the risks associated with those shortfalls need to be identified, analysed and evaluated to inform risk treatment decisions. The risks associated with CP shortfalls will be at their most extreme in a worst case survivable crash and it is these risks that should be considered in the risk assessment.

Table 1 – CP Shortfalls Definitions	
Level of CP Provided to	Description
Good	The level of CP provided to occupants largely meets the CCPDR.
Moderate	The level of CP provided to occupants exhibits some shortfalls against CCPDR. The envelope for 'potentially survivable crashes' is therefore reduced.
Poor	The level of CP provided to occupants exhibits significant shortfalls against CCPDR. The envelope for 'potentially survivable crashes' is therefore markedly reduced.

Table 1: CP risk level definitions

Pre-treatment Risk Assessment.

6.10.37 The level of risk associated with CP shortfalls, based on the existing CP attributes of the design for the current ADF CRE must be established to inform risk treatment decisions. The risk context includes the aircraft CP design and operating context as defined in the Statement of Operating Intent and Usage (SOIU) and supporting operational instructions that may include roles, missions/profiles, operating environment, annual rate of effort and passenger carriage requirements. This risk analysis must be conducted collaboratively by the relevant MDOA/MTCH for airworthiness aspects and MAO representatives for operational aspects. The key activities to be completed include:

a. **Identification of the worst case survivable crash scenario within the ADF CRE.** This activity is largely subjective as it is based on the ADF operating context (roles, missions/profiles, etc.).

b. **Establishing Consequence.** The evaluation of the CP design against the CCPDR (Good, Moderate or Poor) is used to inform the pre-treatment consequence in the event of a survivable crash. The Guidance column in Table 2, together with informed judgement of the operating context by technical and operational representatives, should be used to establish the consequence level.

Table 2 – Safety Consequence and CP Guidance Descriptors

Consequence Label	Safety Matrix Definition	Guidance in CP Context – in the event of a survivable crash
(E) Catastrophic	• Multiple fatalities **OR** 10 or more injuries/illnesses categorised as **'Critical'**	CP Level of Poor – the envelope is significantly reduced. Where there are multiple occupants on-board (typically crew and passengers in vicinity of >10 occupants), it would be expected that there would be multiple fatalities and serious injuries
(D) Critical	• Single fatality and/or permanent disability **OR** 10 or more injuries/illnesses categorised as **'Major'**	CP Level of Poor – the envelope is significantly reduced. Where there are few occupants on-board (typically crew only), it would be expected that there would be at least one fatality and serious injury
(C) Major	• Serious injury or illness requiring immediate admission to hospital as an in-patient and/or permanent partial disability **OR** 10 or more injuries/illnesses categorised as **'Moderate'**	CP Level of Moderate – the envelope is reduced; however, there is a moderate amount of crash protection. Fatalities are not expected to occur, but could occur
(B) Moderate	• Injury or illness causing no permanent disability, which requires non-emergency medical attention by a registered health practitioner **OR** 10 or more injuries/illnesses categorised as **'Minor'**	CP Level of Good – shortfalls are not significant, so the envelope is only marginally reduced. Occupants are not likely to sustain serious injuries, but if occurring it is likely that the injuries are somewhere between serious and minor
(A) Minor	• Minor injury or illness that is treatable in the workplace (first aid) or by a registered health practitioner, with no follow up treatment required	CP Level of Good – while this is potentially a CP context consequence, it is only likely in the 'best case' survivable crashes and would therefore not normally be applicable

c. **Establishing Likelihood.** Likelihood for the CP risk analysis is the likelihood given for the probability of a survivable crash occurring on a per annum basis. This likelihood will be based on a combination of available data inputs including the worst case survivable crash scenario, accident rates (where available for the aircraft being assessed or similar aircraft types), fleet ROE, System Safety Program data (where available and appropriate for use in determining a crash rate) and ADF operating context as defined in the SOIU. Note that an indicative quantitative value for likelihood can be expressed in terms of the percentage likelihood of a survivable crash occurring on a per annum basis, based on the aircraft ROE and the predicted survivable crash rate. Refer to Table 3.

Table 3 – Safety Likelihood and CP Guidance Descriptors			
Likelihood (p.a.) = Predicted Future Crash Rate (crashes/hour x Annual Rates of Effort (ROE) (hours/year) **Likelihood Label** (per year)	**Safety Matrix Definition for *System Context***	***Qualitative Guidance* on the likelihood of a survivable crash**	***Qualitative Guidance* on the likelihood of a survivable crash occurring during fleet operations on a per annum basis**
(5) Almost Certain	• Expected to occur several times a year or often during the system life cycle • Is known to occur frequently in similar systems being used in the same role and operating environment	• Aircraft with known poor safety records and significant safety deficiencies in the ADF CRE context • Aircraft that fly all their operations in the 'challenging environment'	Greater than 20% chance per annum
(4) Probable	• Expected to occur one or more times per year or several times in the system life cycle • Is known to have occurred, but is not certain to occur	• Aircraft that fly high risk flight profiles for most of their operations and/or experiencing high rates of effort are likely to fall under this definition of likelihood • Aircraft that fly the majority of their operations in the 'challenging environment'	Greater than 10% but less than 20% chance per annum
(3) Occasional	• Expected to occur less than once per year or infrequently during the system life cycle	• Aircraft that fly high risk profiles for a substantial part of their operational life	Greater than 5% but less than 10% chance per annum
(2) Improbable	• Not expected to occur, but possible to experience one or more events during the system life cycle	• Aircraft that usually fly low risk flight profiles in a 'benign environment', however sometimes fly high risk profiles as required	Greater than 3% but less than 5% chance per annum
(1) Rare	• Only expected to occur in rare or exceptional circumstances or no more than once during the system life cycle	• Aircraft that fly a majority of their operations in the 'benign environment' • Aircraft that almost always fly low risk profiles and operate similar to RPT aircraft	Less than 3% chance per annum

d. **Establishing Likelihood** - Example. If the survivable crash rate for an aircraft type is determined as 8.5×10^{-6} survivable crashes per flight hour and the fleet annual ROE is 6 500 hours, then the likelihood of a survivable crash occurring on a per annum basis is expressed as: Likelihood = $8.5 \times 10^{-6} \times 6500 = 0.051 = 5.1\%$. Based on the quantitative guidance, the likelihood is evaluated as OCCASIONAL (between 5% and 10%). The qualitative guidance, in conjunction with operational and technical staff judgements, should be used to validate the evaluation, especially when the calculated value is on the margins of likelihood levels, as per the above example calculation. Further analysis of the aircraft type and its CRE may determine that the value calculated is not representative of the actual likelihood. Where appropriate justification is provided, the likelihood level should be adjusted to reflect the level judged to be more appropriate. For example, based on a qualitative analysis, IMPROBABLE may more accurately describe the likelihood for the example case.

e. **Guidance on determining relevant survivable crashes for CP risk analysis.** Many of the issues encountered with the results of risk analysis from implementation of the previous CP policies have been due to poor quantitative evaluation of the risks to occupants in the event of a survivable crash, based on a limited analysis of the survivable crashes for the given aircraft type. In many cases the derived likelihood of a survivable crash occurring has not been representative of future crash rates. Usually, simple extrapolation of the historical accident rates is not indicative of future crash rates of an aircraft. A critical analysis of the accident data can dramatically improve the accuracy of predicted survivable crashes. There will always be uncertainty in predicting future events and a sound analysis of the likelihood should clearly identify and communicate any uncertainty in the predicted crash rate. Poor examples are seen where the crash rate utilised for CP risk analysis is the raw number of accidents experienced divided by the total operational hours flown. This approach can be very misleading, as it usually takes into account accidents that occurred many years into the past which are likely not relevant to the current and future airworthiness framework or the aircraft's current CRE.

6.10.38 A survivable crash is difficult to define and it is almost impossible, in most cases, to obtain detailed crash data to determine which crashes were survivable or not. Therefore, it is very difficult to establish an accurate prediction of future survivable crash rates. As a minimum, the preferred approach is to apply a 'reasonable estimate' of the survivable crash rates. However, if this cannot be established then the analysis may assume that most crashes or serious accidents and incidents included in data sets are survivable in order to determine the most applicable likelihood from one of the five definitions in Table 3. That is, an estimation of the accident rate of the aircraft is the 'best estimation' for the CP risk analysis. Careful assessment and judgement is required to filter applicable data, when considering aspects such as the nature of the crash, deaths versus injuries, world-wide versus single operator data and categories of aircraft damage.

6.10.39 The crash rate should be expressed as a likelihood of a survivable crash occurring on a per annum basis. This is important because the exposure of the risk to occupants is directly related to the rate of effort of the aircraft. The more hours the aircraft operates, the greater the exposure and the greater the likelihood of an accident occurring per year. The converse applies.

6.10.40 Both the qualitative and quantitative guidance in the Guidance columns in Table 3 should be considered by the technical and operational representatives, together with their informed knowledge of the operating context, to determine the likelihood level. The qualitative guidance should be used to assist the evaluation of the likelihood in conjunction with the predicted future crash rate to provide an outcome that suitably reflects the risk level to occupants in the event of a survivable crash.

6.10.41 **Establish the CP risk level.** Apply the established likelihood and consequence determinations to the Defence Harmonised Risk Matrix contained in the DASR.SMS to establish the pre-treatment CP risk level (Very Low, Low, Medium, High, Very High).

CP Risk Treatment.

6.10.42 Assess the availability and suitability of risk reduction options (controls) according to the standard risk management hierarchy of controls, for each shortfall identified against the CCPDR. The assessment is to consider the controls in order of most to least effective, per the standard hierarchy of controls described in DASR.SMS. The end-state for this step is an approved list of additional controls to be implemented for the aircraft system. The key activities to be completed include:

a. Perform a joint airworthiness and operational assessment to review all design based controls, review the current operational controls, and identify possible new controls as per the hierarchy of control options, including any known ‘good practice’.

b. Assess the implementation cost (financial, capability, etc.) for each proposed control.

c. Determine the treatments to be implemented in order to reduce the pre-treatment CP risk level SFARP. In determining the practicability of implementing a control, the applicable Capability Manager should be consulted to ensure there is no unacceptable degradation in the aircraft's operational performance/capability, and a Cost Benefit Analysis (CBA) should be produced to support the decision process. A CBA may be as simple as a basic cost versus benefit statement, through to a comprehensive and detailed analysis. This could include consideration of factors such as capability impact, effect on crew training/workload, etc.

6.10.43 The focus of the CP risk assessment to this point has been in the ‘safety’ dimension using the Defence Harmonised Risk Matrix. The other dimensions of the risk management framework (Mission, Capability, Reputation, Financial and Environment) should also be reviewed to assess the wider implications of the controls being applied for CP. Changes to the risk profile in other risk management dimensions may drive changes to the proposed controls for the safety risk. Accordingly, there will be an iterative approach to the assessment to ensure an appropriate balance between safety and mission, capability, reputation, financial and environment as deemed appropriate by Commanders, Managers and the Authority. Risk Registers, which are currently managed for each aircraft type, should be reviewed for possible flow-on changes to other risks being managed. Where necessary, risks should be updated to consider flow-on impacts to other risk management dimensions, i.e. the controls to be implemented for CP may impact other aspects of the aviation system, and flow-on impacts managed under DASR.SMS.

6.10.44 **Treatment Decision.** Decide, at the appropriate management levels, on the controls to be applied, the priority, and the organisation to implement each control. In making this determination, the decision process for the CP risk analysis and evaluation is to be documented, including the reasons for accepting or rejecting the assessed treatment options, and presented to management to inform risk treatment decisions.

6.10.45 **Post-treatment Risk Assessment.** Similar to the pre-treatment risk assessment, the key activities are re-establishment of the overall CP level (Table 1), re-establishment of the consequence (Table 2) and likelihood (Table 3) levels, and finally, determination of the post-treatment CP risk level using the Defence Harmonised Risk Matrix.

6.10.46 **Risk Management Decision**. Risk management authorities (RMA) reside within the Chain of Command. Unless the relevant Service Chief directs otherwise, based on the final (post-treatment) CP risk level, the CP risk should be processed and retained as per the Risk Retention Thresholds' table within the DASR.SMS. This is to include the proposed controls (Treatment Plan), action agencies, and timeframes for implementation (priority). Additionally, updates to other risk dimension risks should also be presented to the appropriate Risk Management Authority (RMA).

6.10.47 **Risk documentation.** In accordance with DASR.SMS Regulation, CP risk treatment documentation should be produced, reviewed and stored by the responsible organisation as part of their SMS structure.